Report No. 78-1-1

October 1977
5230

EVALUATION OF THE SOUTHERN PINE BEETLE INFESTATIONS ON THE CHICKAMAUGA-CHATTANOOGA NATIONAL MILITARY PARK

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INTRODUCTION

An aerial detection survey of the Chickamauga-Chattanooga National Military Park was conducted by the Forest Insect and Disease Management aerial survey team in September 1977. Ground examinations were conducted by Forest Insect and Disease Management personnel to determine the status of the southern pine beetle infestations on the Park. Beetle activity was first reported on the Park during February 1975.

METHODS

A 100 percent aerial sketchmap survey1/ was conducted on 8,088 acres of the Park. A portion of the spots detected during the aerial phase were examined on the ground to verify the cause of mortality and determine the level of activity in the infested area.

TECHNICAL INFORMATION

Insect - Southern pine beetle, *Dendroctonus frontalis* Zimm.

Host - Southern pine beetle is a native forest pest that will attack all species of southern yellow pine and occasionally other conifers as well. The species of southern yellow pine most susceptible to attack include loblolly (*Pinus taeda* L.), shortleaf (*P. echinata* Mill.), and Virginia (*P. virginiaia* Mill.).

Type of Damage - Death of the tree is the result of mining in the cambium by the southern pine beetle as it constructs egg galleries. The beetle

1/ Detection of Forest Pests in the Southeast. 1970. U.S.D.A., U.S.F.S. SA, S&PF, Div. of FRP, Pub. S&PF-7, Atlanta, Ga. 51 pp.

also introduces blue stain fungi, *Ceratocystis* spp., which slows down or blocks water conduction in the stem. Individual infested spots may range from a single tree to several thousand trees.

Life Cycle of the Beetle - The adult southern pine beetle is a dark reddish brown to black beetle about 1/8-inch long. The beetles attack trees in masses and construct winding S-shaped egg galleries in the cambium. Eggs deposited along the galleries hatch into whitish, curved, legless grubs that feed in the cambium. When fully developed, the larvae mine to the outer bark where they pupate and transform to adults. New adults chew their way to the outside and fly to green trees in the area.

The complete life cycle takes about 30 days during the summer, and as many as four or five generations may be produced annually in the area.

RESULTS

Both the aerial survey and ground examinations show a significant decline in southern pine beetle activity on the Park since the September 1976 evaluation. A summary of past surveys shows the number of spots observed from the air declined from 35 in July 1976 to 13 in September 1977 (see also attached aerial evaluation, Report No. 77-3-44).

Summary of spot size information from aerial survey

	July 1976	April 1977	June 1977	September 1977
No. of Spots	35	30	25	13
Range of Spot Size	1-200	5-500	1-15	1-15
Average Spot Size	44	77	5	7

Ground examination of six spots showed very little southern pine beetle activity. One single lightning-struck tree contained southern pine beetle larvae and pupae. Two spots approximately 5 and 10 trees in size were primarily *Ips* and black turpentine beetle, *Dendroctonus terebrans* (Oliv.), attack with some southern pine beetle associated with them. The southern pine beetle appeared to be occurring as a secondary insect in the infestations. The remaining spots that were ground checked were old southern pine beetle spots with black turpentine beetle being responsible for any insect activity. Spots were small, usually containing 3 to 10 red-topped and green infested trees scattered throughout an area. This is in direct contrast to the southern pine beetle infestation a year ago, when one spot contained several hundred trees actively infested with southern pine beetle. Large areas of dead timber can be seen from the roads and trails as a result.

The situation on the Chickamauga-Chattanooga National Military Park reflects the southern pine beetle decline that has occurred throughout the southeastern states. Very little southern pine beetle activity has been detected, and most bark beetle infestations have been *Ips* or black turpentine beetle, either

alone, or in combination. While southern pine beetle populations remain at a low level on the Park, they will not pose a threat to either stands within the Park or adjoining lands.

RECOMMENDATIONS

Based on the aerial survey and ground examinations, as well as population trends both within the Park and throughout the southeastern states, it is recommended that the Southern Pine Beetle Control Project on the Chickamauga-Chattanooga National Military Park be terminated.

Any suppression measures would entail only cutting, and removing or chemically treating those few trees actively infested with southern pine beetles. It may be desirable to remove those trees infested with black turpentine beetles in order to remove weakened trees where a southern pine beetle population could become established.

To control black turpentine beetle the stump and infested portion of the bole should be sprayed with a 1.0 percent lindane solution to the point of run off.

It is suggested that standing dead trees be removed in areas used by the public, such as along trails, roads, and historical sites, where falling trees and branches would present a hazard to public safety.

Forest Insect and Disease Management will continue to conduct aerial detection surveys of the Park.

POST-SUPPRESSION EVALUATION

During the last fiscal year the Chickamauga-Chattanooga National Military Park has conducted a suppression program involving cutting and spraying southern pine beetle infested trees with lindane. Trees were then disposed of as firewood or in a chipper. Efforts were concentrated in areas heavily used by the public and where southern pine beetle spots threatened adjacent lands. In this manner, several large, active spots were controlled. Examination of some of the areas in April 1977, revealed no further southern pine beetle activity. As reported in the current evaluation, there was very little southern pine beetle activity throughout the Park. The natural decline of southern pine beetle populations, in conjunction with control efforts by Park personnel has resulted in an endemic southern pine beetle population.